

# EFM System Model, Block Diagram, Layer Diagram and Common Terms

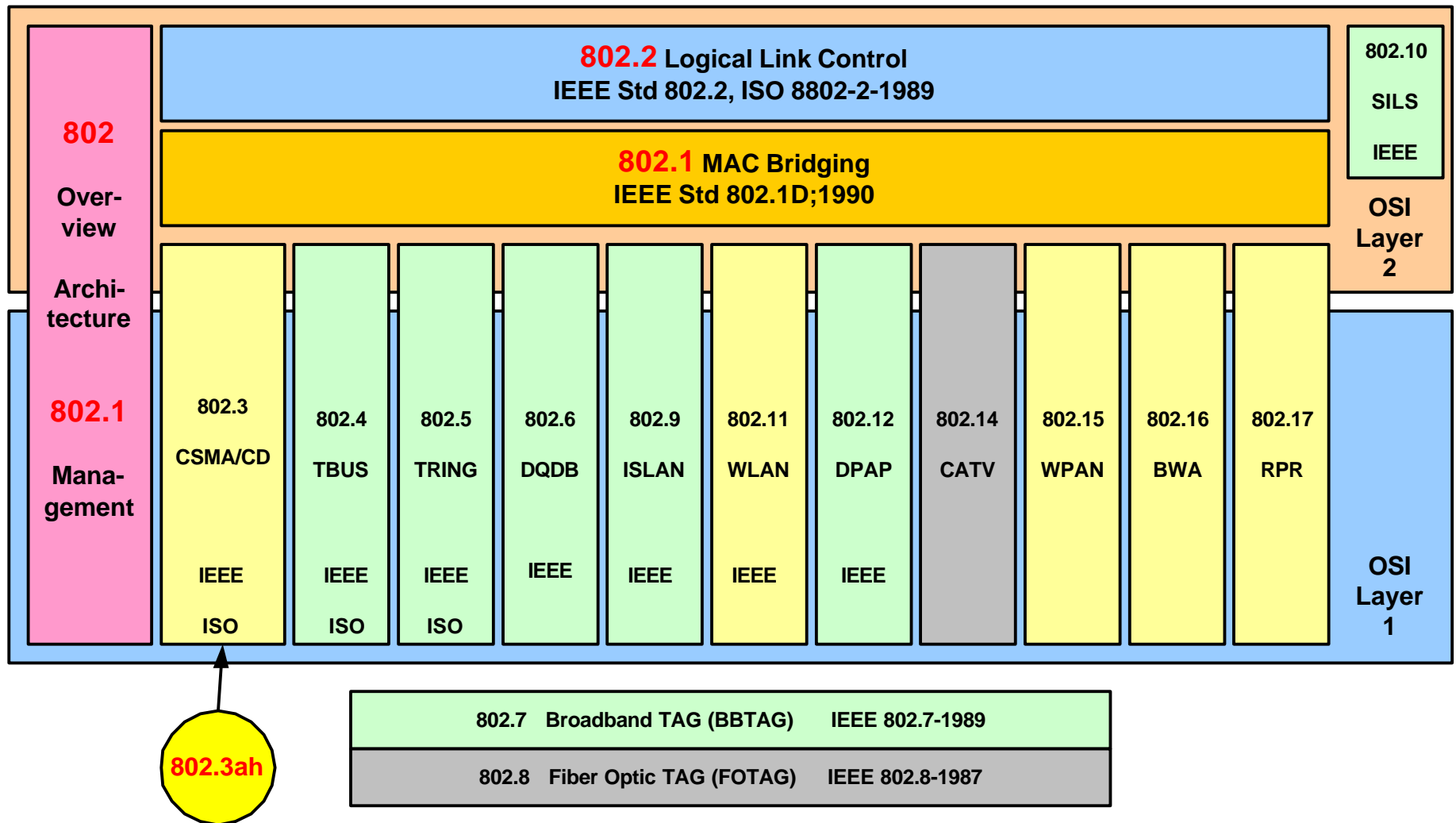
Anderson, Tony	Zonu	Bhatt, Vipul	Finisar
Chen, Raymond	Virata	Diab, Wael	Cisco
Eaton, George	Intel	Frazier, Howard	Dominet
Haran, Onn	Passave	Hirth, Ryan	Terawave
Gao, Wei	Salira	Gummalla, Ajay	Broadcom
Koziuk, Glen	Vitesse	Kuo, JC	Alloptic
Murphy, Tom	Infineon	Pickens, John	COM21
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Sala, Dolors	Broadcom	Stanley, Patrick	Elastic
Stiscia, Jim	Virata	Thatcher, Jonathan	WWP

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# 802 Overview and Architecture



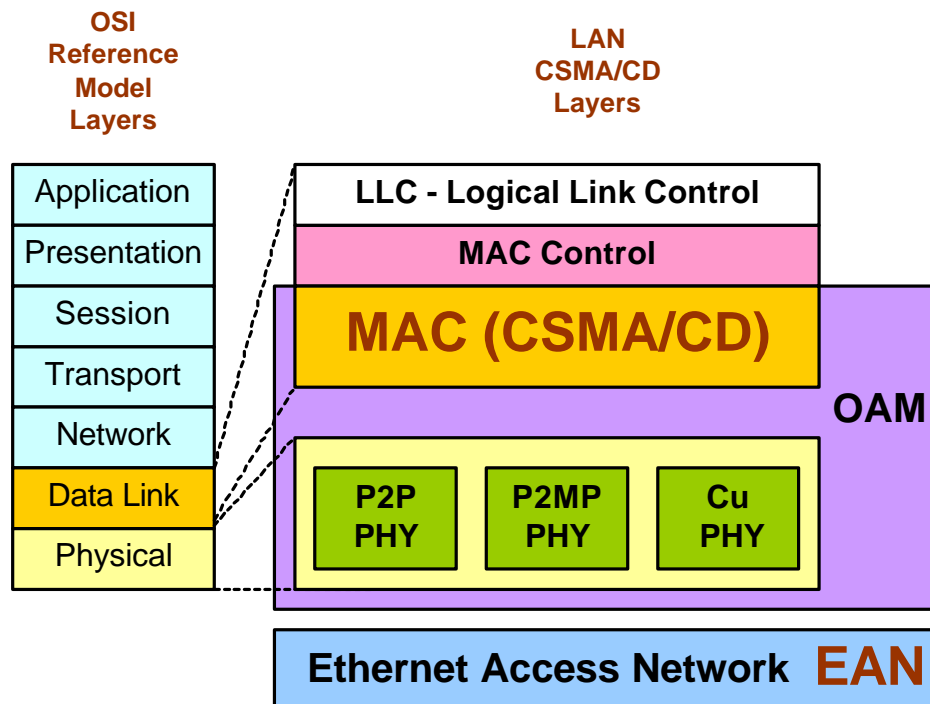
# 802.3ah Overview and Architecture

## Title

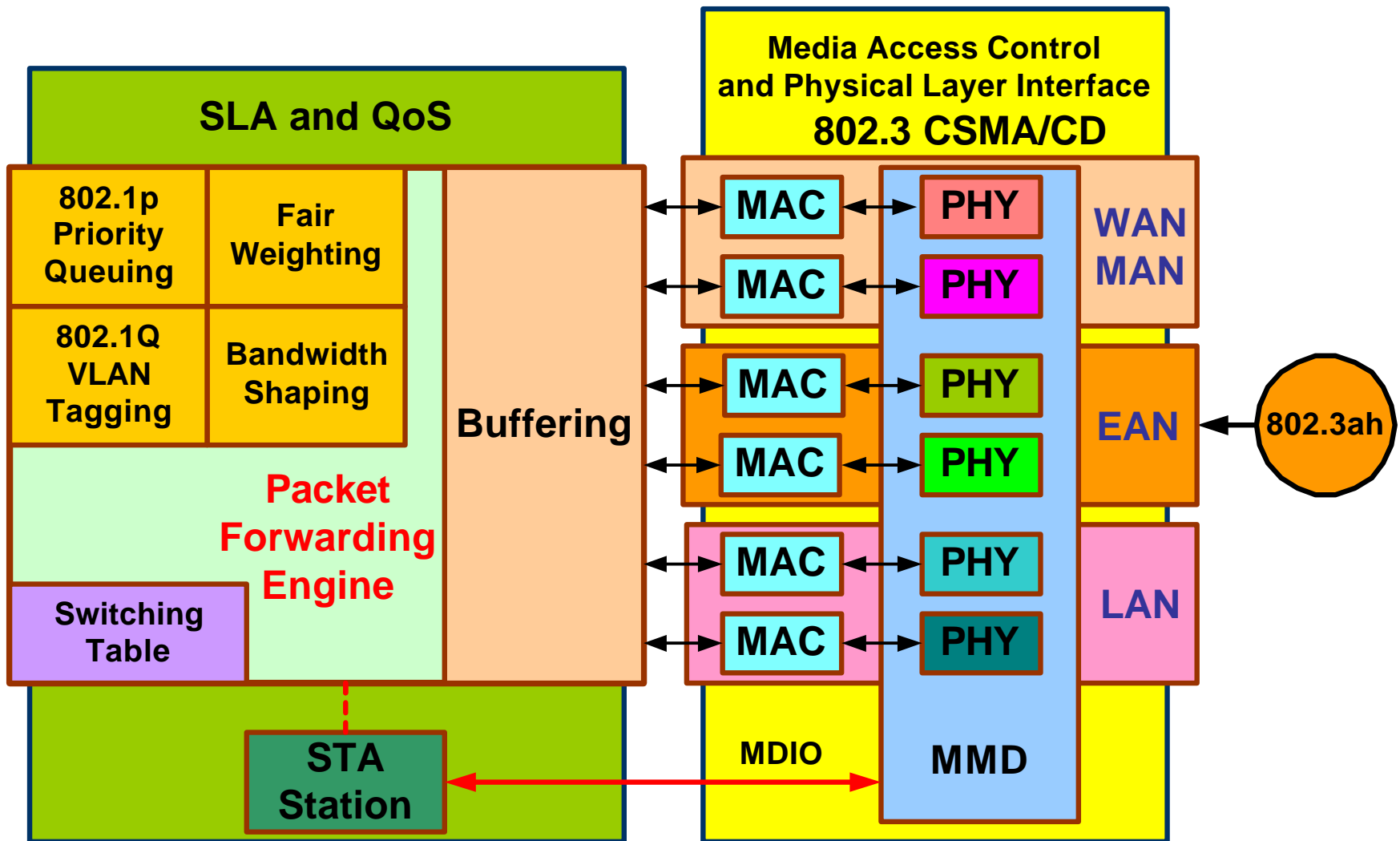
---Carrier sense multiple access with collision detection (CSMA/CD) access method and physical layer specifications -  
**Media Access Control Parameters, Physical Layers and Management Parameters for subscriber access networks**

## Scope

Define 802.3 **Media Access Control (MAC) parameters** and **minimal augmentation of MAC operation, physical layer specifications, and management parameters** for the transfer of **802.3 format frames** in **subscriber access networks** at operating speeds within the scope of the current IEEE Std 802.3 and approved new projects



# System Model – Switched Ethernet



# 5 Subject Areas

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**CMP:** Compliance Issues

**LIA:** Liaison (OAM, 802.1, ITU-T, etc.)

**REQ:** Network Requirements

**PMD:** Optics and Copper

**PTL:** Protocol

# Subject Area: **CMP**

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## **CMP:** 802.1 and 802.3 Compliance

- How to be Ethernet
- Peer-to-peer network
- Compliance with existing standards
  - 802.1d – Bridging
  - 802.3ad – Link aggregation
  - 802.3x – Flow control

# Subject Area: **LIA**

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## **LIA**: Liaisons

- 802.3ah OA&M requirements
- 802.3ah OA&M channel allocation (in/out-band, MAC control, PHY...)
- 802.3ah Environmental requirements
- 802.1 (VLAN, etc)
- ITU-T, TIA
- Other tangential groups



# Subject Area: **REQ**

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## **REQ**: Network Requirements

- Service provider issues & perspectives
- Ethernet Access Network requirements
- Application and service requirements
- Performance requirements (delay, jitter, close-loop constant,....)
- Splitting ratio/distance requirements
- Security and protection requirements
- Feedback to **PMD** and **PTL** groups

# Subject Area: **PMD**

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## **PMD**: Optics and Copper

- Optical link budgets modeling
- Outside Plant
- Wavelength Plan
- Optical transceiver issues
- Definition of optical interfaces and terms
- Input to system guard band analysis
- Higher link budgets (APD and FEC)
- Copper PHY issues

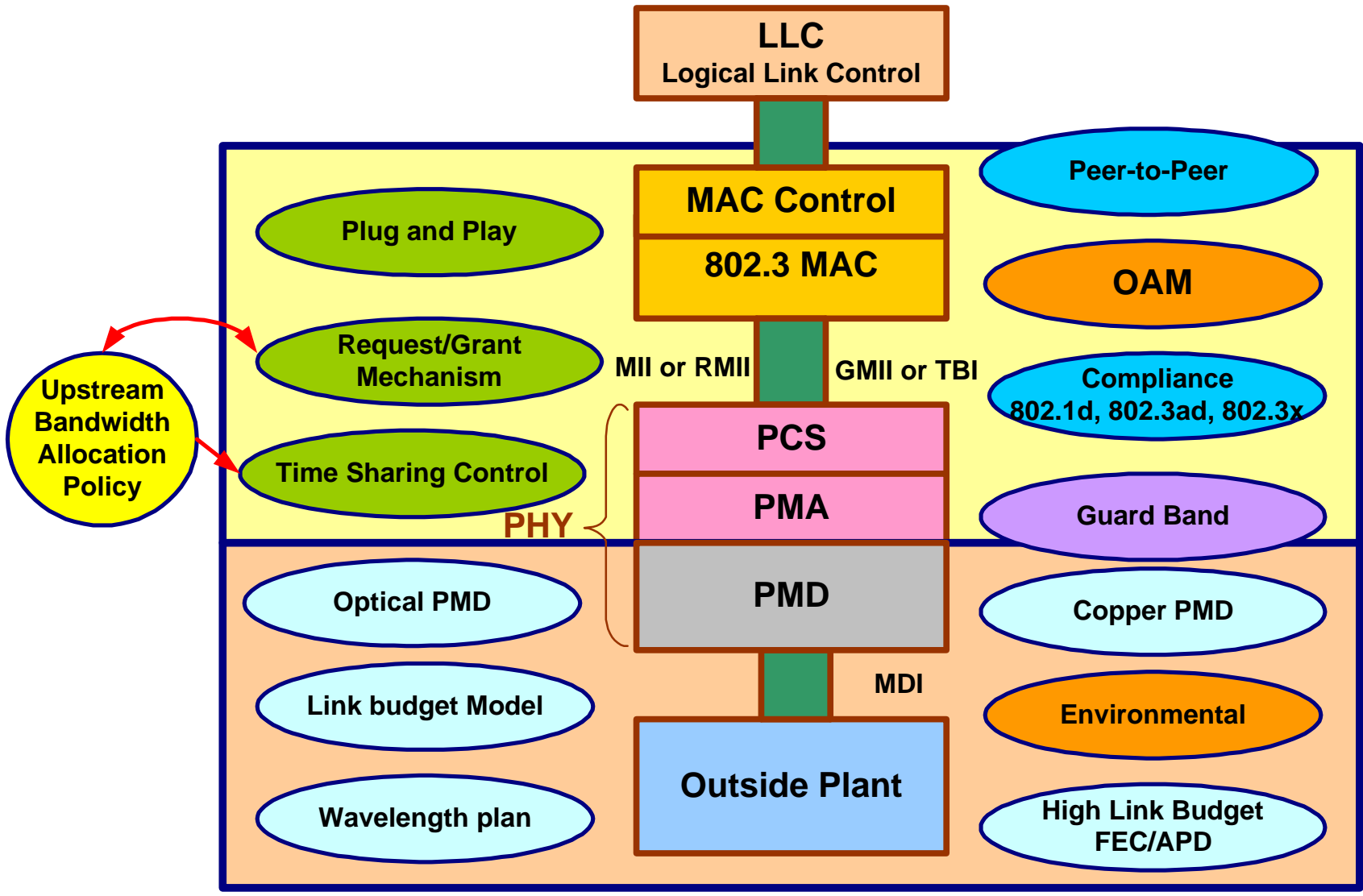
# Subject Area: **PTL**

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## **PTL**: Protocol

- Time sharing control
- Plug and Play
- Bandwidth resource allocation
- Traffic modeling
- Simulation and performance analysis
- Link level OAM support

# Layer and Block diagram



# Definitions and Terminology (1)

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<b>Abbr.</b>	<b>Term</b>	<b>Definition</b>
<b>EPON</b>	Ethernet Passive Optical Network	Network that carries Ethernet frames over a passive point-to-multiple points optical physical interface
<b>OAN</b>	Optical Access Network	The set of access links sharing the same network side interface and supported by optical access transmission system
<b>ODN</b>	Optical Distribution Network	Provides the optical transmission medium from the OLT towards ONT and vice versa between optical interface reference point
<b>OLT</b>	Optical Line Terminal	Equipment that provides network side interface of the OAN
<b>ONT</b>	Optical Network Termination	An ONU used for FTTH application and includes user port function
<b>ONU</b>	Optical Network Unit	Equipment that provides access (user) side interface of the OAN
<b>P2MP</b>	Point to Multiple Point	A network configuration which has one input/output at one end with multiple input/output at the other end
<b>P2P</b>	Point to Point	A network configuration which has one input/output at one end with one input/output at the other end
	Ranging	Procedure to measure optical round trip time between OLT and ONT
	Diplex	The use of a different wavelength for each direction of transmission over a single fiber
	Duplex	The use of the same wavelength for both direction of transmission over a single fiber
	Simplex	The use of a different fiber for each direction of transmission
	Downstream	The transmission direction from OLT to ONU
	Upstream	The transmission direction from ONU to OLT

# Definitions and Terminology (2)

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<b>Abbr.</b>	<b>Term</b>
<b>APD</b>	Avalanche Photo Diode
<b>CDR</b>	Clock and Data Recovery
<b>DBA</b>	Dynamic Bandwidth Allocation
<b>EAN</b>	Ethernet Access Network
<b>FEC</b>	Forward Error Correction
<b>FTTB</b>	Fiber To The Building
<b>FTTCab</b>	Fiber To The Cabinet
<b>FTTC</b>	Fiber To The Curb
<b>FTTH</b>	Fiber To The Home
<b>MAC</b>	Media Access Control
<b>MDU</b>	Multi-Dwelling Unit
<b>MTU</b>	Multi-Tenant Unit
<b>OAM</b>	Operation Administration Maintenance
<b>ODF</b>	Optical Distribution Frame
<b>MDIO</b>	Management Data Input/Output
<b>MMD</b>	MDIO Management Device
<b>PCS</b>	Physical Coding Sublayer
<b>PHY</b>	Physical Layer Device
<b>PMA</b>	Physical Medium Attachment
<b>PMD</b>	Physical Medium Dependent
<b>STA</b>	Station
<b>TC</b>	Transmission Convergence
<b>TDMA</b>	Time Division Multiple Access